
Appendix E

(Revised)

BIOLOGICAL ASSESSMENT

Activities Related to

Wildlife Habitat, Forest Management, and Roads

Stony Creek Project



USDA-Forest Service
Cherokee National Forest
Watauga Ranger District
Carter County, Tennessee

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1.0 INTRODUCTION

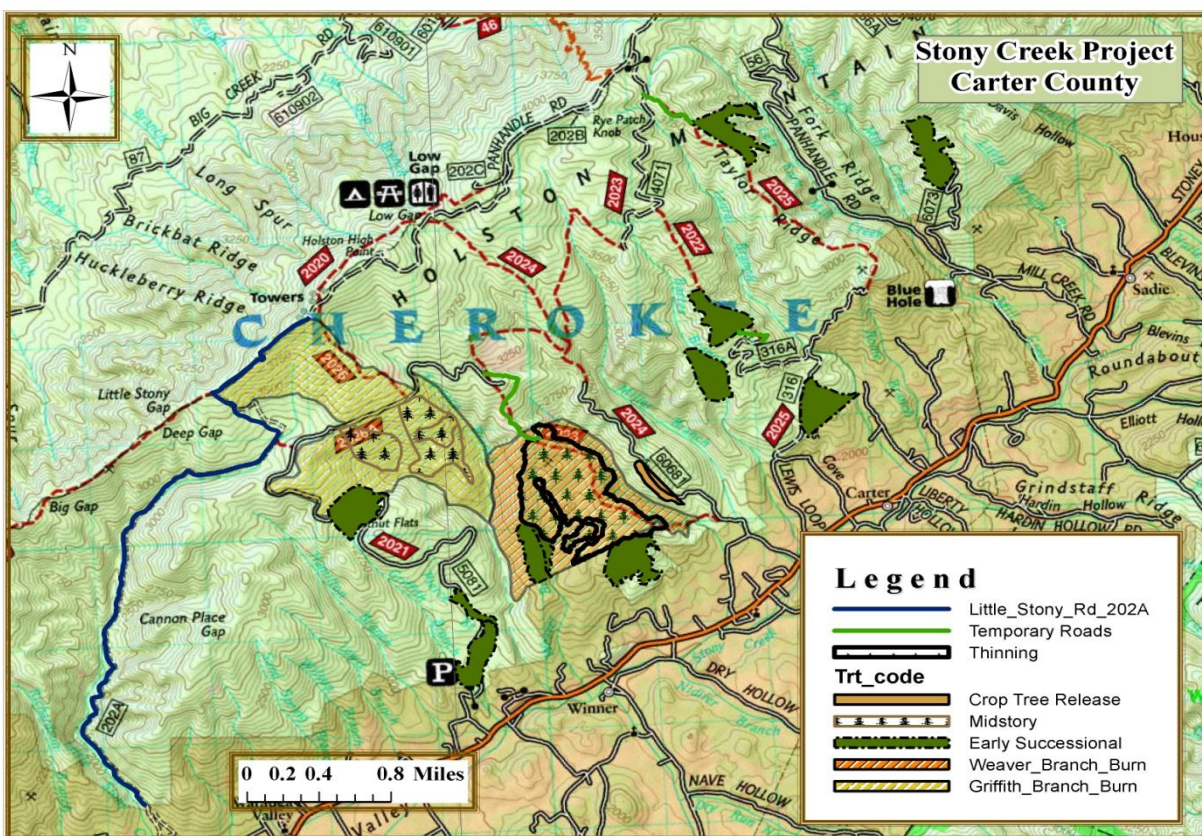
The purpose of this biological assessment (BA) is to document any potential effects of the project on Threatened and Endangered (T&E) species or their habitats, and to ensure land management decisions are made with the benefit of such knowledge. The objectives of this assessment are to:

- 1) Comply with the requirements of the Endangered Species Act that actions by federal agencies not jeopardize or adversely modify critical habitat of federally listed species.
- 2) Provide a process and a standard by which T&E species receive full consideration in the decision-making process.

1.1 AFFECTED AREA AND SCOPE OF ANALYSIS

The **scope of analysis** for available habitat, direct effects, and indirect effects on T&E species includes the Stony Creek watershed of Carter County, Tennessee. The affected area (Figure 1) includes portions of Compartments 66-69 and 71-73. Analysis of cumulative effects is limited to those effects of future State or private activities, not involving Federal activities, which are reasonably certain to occur within the action area of the Federal activity subject to consultation and none are known for the project area.

FIGURE 1. STONY CREEK PROJECT AREA MAP



Approximately 11,921 acres of the watershed are within the Big Laurel Branch Wilderness and Study Area. Aquatic habitats in the affected areas include 9 cold headwater streams: Bartee Branch, Furnace Branch, Griffith Branch, Hinkle Branch, Laurel Branch, Little Stony Creek, Left Fork Mill Creek, Right Fork Mill Creek, and Miller Branch. Elevations of affected areas range from 1,920 to 4,320 feet MSL. No northern hardwood forest occurs in or near any affected areas. The slopes in the affected areas are mostly southerly facing slopes. Table 1 lists the terrestrial habitats available in the project area.

TABLE 1. TERRESTRIAL HABITATS OF THE STONY CREEK WATERSHED

Major Forest Communities	Acres	Percent of Area
Mesic deciduous (MDF)	16,557	57%
Eastern Hemlock/White Pine (EHWP)	197	1%
Oak & oak-pine (OOPF)	21,076	72%
Successional Habitats	Acres	Percent of Area
Early successional (ESF)	0	0%
Sapling/pole (SPF)	1,522	5%
Mid-successional (MSF)	2,118	7%
Late-successional & old growth (LSOG)	25,323	87%
Other Terrestrial Habitats	Acres	Percent of Area
Permanent openings (PO)	234	1%
High elevation shrubby habitats (HESH)	75	0%
Snags, dens, downed wood (SDDW)	27,441	94%

1.2 PROPOSED ACTIONS IN PREFERRED ALTERNATIVE

Alternative C

Activities proposed are listed in Table 2. **Early successional habitat** (ESH) would be created using commercial timber harvest (shelterwood) and non-commercial regeneration. An average basal area of 15-25 ft²/acre of shelterwood reserve trees would be left on site to create a two-aged stand structure along with new regeneration. **Thinning** stands (commercial) would restore upland oak and shortleaf pine. Final basal area (BA) would range from 35-60 ft²/acre, removing damaged and disease trees first, then scarlet and black oak, red maple, and white pine. Reserve trees in both treatment types would include dens, large mast producing trees, and yellow pine. All early successional and thinned stands would require pre- and post-harvest treatments:

- **Pre-harvest site preparation:** Midstory species would be controlled with herbicide (Imazapyr and Glyphosate) to reduce post-harvest sprouting of overly-competitive species.
- **Mast tree seedling plantings (*Early Successional Only*):** Seedlings of mast-producing tree species would be planted in regenerated areas to augment natural reproduction.
- **Post-harvest treatments:** One-two years after harvest, use chainsaw slashdown or herbicide (Imazapyr and Glyphosate), and two-four years after harvest, use herbicide (Triclopyr) to reduce competitive sprouts. At age 10, slashdown to release mast-producing trees or shortleaf pine.

Crop tree release around selected mast-producing trees would be implemented using chainsaws.

Midstory treatments with herbicide would reduce the stocking density of understory and midstory trees.

Prescribed burns (low-intensity) would be conducted using existing roads, streams, dozer and hand tools for control lines. If the burn objectives were not fully met, a follow-up burn would be conducted and may continue on a two to ten-year rotation.

Wildlife Habitat Improvements after harvest would include bat roost and nest boxes (Years 1-3); construct vernal ponds (Years 1-2); provide grouse drumming logs (Years 3-4); convert temporary road and landing to wildlife openings (Years 1-2).

Maintain existing roads and create temporary roads: Existing roads would be maintained, and temporary roads would be constructed in support of timber sale activities. Temporary roads would be closed after the timber sale. **Authorize roads** as recommended in the Stony Creek Travel Analysis Process Report (2010).

Little Stony Road: Decommission road along stream and convert portions to trail. Remove bridge, stabilize banks and stream crossings, install water diversions, obliterate and re-contour sections (0.65 mile), and remove illegal structures. Reroute portion of trail, (500 feet), construct new connector trail (0.6 mile), and create small parking area (0.1 acre).

TABLE 2. PROPOSED ACTIVITIES IN ALTERNATIVE C

Action	Habitat	Successional Stage	# Stands	Area
Shelterwood Harvest	Deciduous & White Pine-Hemlock Forest	Mid to Late	10	303 acres
Non-commercial Regeneration	Deciduous Forest	Late	1	32 acres
Thinning	Deciduous Forest	Sapling/Pole to Late	6	204 acres
Pre-Harvest Site Preparation	Deciduous & White Pine-Hemlock Forest	Early	17	539 acres
Post-Harvest Treatments	Deciduous & White Pine-Hemlock Forest	Early	17	539 acres
Mast Tree or shortleaf pine planting	Deciduous & White Pine-Hemlock Forest	Early	Up to 17	Up to 539 acres
Crop Tree Release	Deciduous Forest	Sapling/Pole to Late	2	13 acres
Midstory	Deciduous Forest	Sapling/Pole to Late	3	116 acres
Prescribed burns	Mixed Forest	Sapling/Pole to Late	2 burn areas	1,057 acres
Little Stony Road Decommission	Riparian Forest & Stream Crossings	Mid to Late	-	5 miles
Nest/Roost Boxes	Deciduous & White Pine-Hemlock Forest	Early	9- 17	18 boxes
Waterholes	Deciduous Forest/Permanent Openings	Early to Late	5	5 ponds
Grouse Drumming Logs	Deciduous Forest	-	-	45 logs
Road Maintenance	Mixed Forest	Mixed	-	6.3 miles
Temporary Road Construction	Deciduous Forest	Early to Late	-	1.3 miles
Authorize Existing Roads	-	-	-	8.2 miles

Design Criteria

Specific actions will be incorporated into the project design and implementation.

1. Use broad-based dips or water bars on all access ways on non-level slopes.
2. Use a hydrologist or wildlife biologist to assist in the location of ephemeral pools, springs and seeps.
3. Implement Tennessee Best Management Practices (BMPs) as a minimum to achieve soil and water quality objectives. When RLRMP Standards exceed BMPs, the standards shall take precedence over Tennessee BMPs.
4. Streamside management zones (riparian corridors and filter zones) would be established, as specified in the RLRMP.
5. Any new threatened, endangered, and/or sensitive species locations discovered within a project area may result in all actions being delayed or interrupted within the area. The appropriate district wildlife/fisheries biologist or botanist would be consulted to determine effects of the action on the species.
6. Trees known to have been used as roosts by Indiana bats are protected from cutting and/or modification until they are no longer suitable as roost trees unless necessary for public safety. Consultation with the US Fish and Wildlife Service (FWS) must occur before cutting or modification.
7. Snags with exfoliating bark are not intentionally felled unless necessary for public safety. Exceptions may be made for small-scale projects such as insect/disease control, salvage harvesting, and facility construction.
8. During all silvicultural treatments in hardwood forest types, retention priority is given to the largest available trees that exhibit characteristics favored by roosting Indiana bat.
9. Leave (reserve) areas and exclusions would be established, where necessary to minimize impacts to rare species. All ground-disturbing activities (temporary roads, landings, skid trails, etc.) and timber harvest would be excluded from within the reserve areas.
10. Mixing-water for herbicide use would be brought to the site by work crews and not obtained from streams or other bodies of water.
11. No herbicide would be applied within 30 feet of open water except for selective treatments that use herbicides labeled for aquatic use.
12. Off-road equipment would be cleaned of seeds, soil, vegetative matter, and other debris that could hold NNIS seeds and/or propagules. Off-road equipment would be inspected by a Forest Service representative to prevent NNIS introduction or spread in the project areas.
13. Build the fewest skid trails, logging roads, and log landings as feasible.
14. Skid trails would be placed and rehabilitated in a way that limits the spread of existing non-native invasive species from roads, trails, or powerline corridors, into stand interiors. Skid trails and plow lines would be rehabilitated (re-contoured, seeded, etc) after they are no longer needed.
15. Any cultural resource sites found during implementation of the project would be reported immediately to a Forest Service Archaeologist and work would stop in the area.
16. Skid trails and temporary roads for the purpose of timber harvest would not be constructed for sustained distances over 200 feet in areas with slopes of 40% or greater ("steep area"). The 200-foot length can be exceeded however where the skid trail and/or temporary road is needed to traverse a steep area in order to access the remaining harvest unit(s). Trees within the traversed steep area would not be harvested, except where possible through cable winching to equipment placed outside the steep area.
17. Blend the visual impacts of roads and skid trails so they remain subordinate to the existing landscape character in size, form, line, color, and texture.
18. Orient openings to blend with the existing landscape characteristics, based on existing vegetation patterns, contours and other natural-appearing features.
19. Shape and feather unit boundaries to avoid straight edges.
20. Retain natural-appearing tree groupings.

21. Minimize the exposure of mineral soils during construction of skid roads and trails, and revegetate cut-and-fill slopes to the extent possible.
22. Screen log landings from view, and restore as close to the original contour as possible.
23. Minimize impacts to existing trails and travelways, and maintain the visual character in the vicinity of trail corridors and travelways.

2.0 CONSULTATION HISTORY

In a letter dated February 26, 2013, Mary Jennings (FWS) sent a letter to the Cherokee National Forest (CNF) pertaining to project-specific Indiana bat surveys and proposed habitat use study on the north end of the CNF. The letter states that “During the period of the O’Keefe study, a substantial amount of time will be devoted to acoustic and netting surveys. Given this effort, I believe additional, project-specific bat surveys will not be necessary during the duration of this study to address the potential impacts of CNF projects on the north end of the CNF. Therefore, my staff will no longer be providing recommendations to conduct site-specific bat surveys in conjunction with individual projects...” This project falls under the period of the O’Keefe study, and site-specific bat surveys have not been conducted.

On March 22, 2012, the original Stony Creek Biological Assessment was completed and sent to the FWS. In April new information regarding the project resulted in changes in Alternative C. This then became the preferred alternative, and a revised Biological Assessment was needed. On April 15, 2012, Marcia Carter contacted Dave Pelren, FWS to let them know of the change.

3.0 SPECIES EVALUATED AND METHODS USED

This BA addresses T&E species that are considered to occur or have habitat on the CNF. Analysis of the project was conducted using the best available science, including references from science-based websites, books, papers, and reports. Information from field surveys and TES database maps identified T&E species known to occur in the project area. Project area habitat and species habitat requirements, distributions and limiting factors were used to determine if additional T&E species were likely to occur in the project area.

The Threatened and Endangered Species List on the CNF (Jennings 2011) was reviewed to determine T&E species to consider. Each species, listed in Attachment A, was evaluated and given a Project Review Code (PRC) using a list (Attachment B) for evaluation. This process, used to decide when to inventory for T&E species, is consistent with FSM 2672.43. Some of the PRC’s are used for a Determination of Effect (see Attachment B).

Bat surveys were conducted in six locations across the analysis area during the Bat Blitz of 2007, including three sites near proposed activities. Fish surveys were conducted in the project area from 2003 to 2012. Botanical surveys including bryophytes and vascular plants were conducted in the proposed treatment areas (Leftwich, et al 2012).

4.0 HABITAT RELATIONSHIPS, EFFECTS ANALYSIS, AND DETERMINATIONS OF EFFECTS

Based on absence of habitat in the project area or the project occurring outside of the species range,

the proposed project would have “no effect” on the following species. No spruce fir and northern hardwoods are in the project area, so no habitat is present for Carolina northern flying squirrel. The spruce-fir moss spider, rock gnome lichen, spreading avens, Roan Mountain bluet, and Blue Ridge goldenrod are found only in open, rocky habitats at elevations above 4,200 feet. The bog turtle occurs in wetlands. The blue shiner, spotfin chub, Citico darter, smoky madtom, yellowfin madtom, amber darter, Conasauga logperch, snail darter, Appalachian elktoe, tan riffleshell, upland combshell, southern acornshell, fine-lined pocketbook, Alabama moccasinshell, Coosa moccasinshell, southern clubshell, southern pigtoe, Georgia pigtoe, ovate clubshell, triangular kidneyshell, and Cumberland bean pearly mussel are restricted to free-flowing rivers. The Ruth’s golden aster is restricted to the Hiwassee and Ocoee Rivers. Virginia spiraea is only known, historically, from the CNF at a site on the Nolichucky River in Unicoi County. Small whorled pagonia was not found during site specific surveys. Implementation of the Stony Creek Project would not affect any of the 29 T&E species discussed above.

4.1 GRAY BAT (*Myotis grisescens*)

Habitat Relationships

This bat is found throughout the limestone region of southern middle-western and southeastern United States (Whitaker 1998). It has been documented at 10 locations on the CNF, most on the North End. Gray bats use caves year-round for hibernating, maternity colonies, and roosting. The closest cave to the project area with a summer colony is approximately five miles away in Sullivan County. They forage for insects over water along riparian areas and shorelines with forest cover (Mitchell 2001). Foraging habitat may occur along the streams in the analysis area.

Gray bats are threatened by the destruction of hibernacula (Harvey, et al 1999) and white nose syndrome, a fungus that attacks hibernating bats. White nose syndrome has now been found in Tennessee. Large scale population declines may occur in the future as the disease continues to spread.

Direct and Indirect Effects

No direct effects are expected for gray bat. Habitat associated with caves would not be impacted because no caves are located within the project area. Hibernacula and maternity colony habitat would not be affected. Activities would occur during the day while bats are roosting in caves and are absent from the project area.

Four early successional, the thinning and two crop tree release stands are adjacent to small, streams that are typically choked with rhododendron or other vegetation. These streams would not be suitable foraging habitat for gray bat. Riparian zone restrictions (no harvest within 100 feet of perennial streams) and streamside buffer zones (no herbicide or ground disturbance) would protect foraging habitat from changes to vegetation and water quality. Harvest in other stands would have no indirect effects on gray bat.

Road decommissioning, obliteration, recontouring, and trail relocation, would improve water quality along Little Stony Creek where gray bats may forage. Road maintenance and authorization, crop tree release, and grouse drumming log installation would have no effect on gray bat.

The herbicides used for post harvest and midstory treatments are unlikely to contact gray bats directly, but may be present in trace amounts on insects. The herbicides used are of low toxicity to mammals (Tu et al 2001). Herbicides would be used across 681 acres, but only a portion of the

acres treated would be directly impacted. The following factors would minimize the risk of contamination: 1) herbicide applied in small amounts; 2) specific methods of application such as thinline or stump treatments; and 3) design criteria for herbicide use such as timing to avoid rainfall and buffer zones.

Cumulative Effects

Private land within the analysis area is predominantly in forested condition and no known future activities are expected to occur. Therefore, no cumulative effects to gray bats would occur.

Determination of Effect

The proposed project is ***not likely to adversely affect*** gray bat because effects would only be minor and indirect.

4.2 INDIANA BAT (*Myotis sodalis*)

Habitat Relationships

Indiana bat occurs from Vermont to Michigan, south to South Carolina, west to Alabama, Indiana to Arkansas, and Oklahoma. Only nine hibernacula in three states (KY, IN, MO) harbor 75% of the remaining population (NatureServe 2012). No hibernacula are known from the CNF, but one is located in the Great Smoky Mountains National Park, where several maternity roosts have been located. Four additional hibernacula are located within 40-70 miles of the CNF. On the CNF, this bat has only been documented in Monroe County (summer), and has not been captured in the project area or on the North End. Mist netting and acoustic surveys were conducted in the project area in 2007, and no Indiana bats were captured or detected. Site specific surveys for this project were not conducted (see *Consultation History*).

In the Southern Appalachian region, females currently establish primary maternity roosts under the sloughing bark of dead yellow and white pines and eastern hemlock (O'Keefe, pers com, 2012). Single bats may use a variety of tree species for roosts, as long as there is available sloughing bark or crevices on those trees. The majority of roosts are on mid and upper slopes in mixed pine-hardwood stands, but some roosts have been found near streams. This bat forages for flying insects along river and lake shorelines, in canopy gaps over upland waterholes, and along roads and trails. Caves are used for hibernacula. The Indiana bat returns to hibernacula beginning in late August (NatureServe 2012). The species forage for flying insects along waterways, floodplains, and over upland waterholes (NatureServe 2012). Foraging, roosting, and potential maternity habitats are available on the CNF and in the project area.

Indiana bats are threatened by white nose syndrome, a fungus that attacks hibernating bats. White nose syndrome has now been found in Tennessee. Large scale population declines are expected over the next several years as the disease continues to spread.

Direct and Indirect Effects

The potential of the project to directly impact Indiana bats is extremely low to non-existent. There are no known hibernacula on the CNF, no caves are present in the project area, and no Indiana bats have been found on the North End of the CNF. Should an Indiana bat roost site be discovered prior to and/or during project implementation, project activities would stop, and the CNF would again consult with the FWS.

The proposed project would indirectly affect Indiana bat by alteration of roosting and foraging habitat. Removal of trees during harvest, temporary road construction, trail construction, and road obliteration/recontouring would contribute to the loss of future roosting habitat. However, Indiana bats have adapted to these types of situations as roost trees are temporary in nature (Pers. Comm.: O'Keefe 2011). The 15-20 basal area per acre (BA) remaining in early successional areas and 35-60 BA in the thinned area would ensure that roosting habitat would continue to be available in harvested stands over the next five years. The RLRMP requires the largest trees with favorable conditions for roosting bats to be left. It also requires retention of all shagbark hickory trees (>6 inch diameter) and snags with exfoliating bark. New snags would develop from trees damaged during harvest, creating roosting habitat in the future. Installation of bat boxes would also provide additional roosting habitat. The overall effect of these harvest activities would provide open patches of forest with standing snags for roosting. The open condition of these areas would make roosting habitat more suitable by providing more sunlight to maintain warmer conditions in the roost.

Creation of early successional habitat, thinning, midstory, and crop tree release would increase light intensity and herbaceous plant diversity for the next five to ten years. Conversion of a temporary road and log landing to a wildlife opening would increase open conditions, plant diversity, and create travel corridors. These activities would increase insect production and improve forage conditions for bats. Construction of vernal ponds would supply upland water sources and improve foraging conditions.

The herbicides used for post harvest and midstory treatments are unlikely to contact Indiana bats directly, but may be present in trace amounts on insects. The herbicides used are of low toxicity to mammals (Tu et al 2001). Herbicides would be used across 681 acres, but only a portion of the acres treated would be directly impacted. The following factors would minimize the risk of contamination: 1) herbicide applied in small amounts; 2) specific methods of application such as thinline or stump treatments; 3) design criteria for herbicide use, e.g. timing to avoid rainfall.

Crop tree release, road maintenance, authorization, and decommissioning, trail relocation, and grouse drumming log installation would have no effect on Indiana bat.

Cumulative Effects

Private land within the analysis area is predominantly in forested condition and no known future activities are expected to occur. Therefore, no cumulative effects to Indiana bats would occur.

Determination of Effect

The proposed project is ***not likely to adversely affect*** Indiana bat because effects would only be minor and indirect with some being beneficial.

5.0 SUMMARY OF EFFECTS DETERMINATIONS

Table 3 summarizes the determinations of effect for each species.

TABLE3. DETERMINATIONS OF EFFECT FOR ALTERNATIVE C

Species	Federal Status	Determination of Effect
Gray Bat	Endangered	Not likely to adversely affect
Indiana Bat	Endangered	Not likely to adversely affect

6.0 SIGNATURE OF PREPARER

/s/ Marcia S. Carter
North Zone Fisheries Biologist
June 11, 2013

7.0 REFERENCES AND DATA SOURCES

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ATTACHMENT A

Stony Creek Project Threatened and Endangered Species 2001 List Revised 1/3/2012 MSC

	Scientific Name	Common Name	Range/Watersh/Co	CNF Records	Habitat Information	T&E	G-Rank
Arachnids							
1a	<i>Microhexura montivaga</i>	Spruce-fir moss spider	Mountains of NC, TN	3 TDEC records; Roan Mtn.; Carter Co.	Moss and liverwort mats on rocks/boulders in mature spruce-fir forest > 5400 ft.	E	G1
Mammals							
1a	<i>Glaucomys sabrinus coloratus</i>	Carolina northern flying squirrel	Mountains of NC, TN, VA	4 TDEC records; Monroe and Carter Cos.	Mature spruce fir and adjacent northern hardwood/hemlock forests above 4000 feet; abundant snags & woody debris, fungi	E	G5T1
6a/7a	<i>Myotis grisescens</i>	Gray bat	VA to KS south, from TN to OK; SC to FL, AL	4 TDEC records, Cocke & Greene Cos.; pvt in Carter & Sullivan Cos.	Uses caves year round; forages along riparian areas/shorelines with forest cover	E	G3
6a/7a	<i>Myotis sodalis</i>	Indiana bat	VT to MI south, to SC, AL; IA to AR, OK	1 TDEC record; Monroe Co; addtl. ANABAT records Monroe Co.	Hibernates limestone caves; maternity roosts primarily hollow trees or trees with loose bark; forages riparian areas and upland water holes	E	G2
Fish							
1a	<i>Cyprinella caerulea</i>	Blue shiner	C	5 occ Conasauga R #1 & #2; Jack's R; Sheeds Cr & Mooneyham Cr	Large streams, small to medium-sized rivers, moderate gradient, low elevation	T	G2
1a	<i>Erimonax monachus</i>	Spotfin chub	LT,FB,SH	1 occ Experimental pop. in Tellico R #1	Large streams, moderate gradient, low elevation	T	G2
1a	<i>Etheostoma sitikuense</i>	Citico darter	LT	2 occ Citico Cr. #1 & Experimental pop. in Tellico R #1	Large creeks & small-med rivers 10-80 m wide; moderate gradient, warm	E	G1
1a	<i>Noturus baileyi</i>	Smoky madtom	LT	2 occ Citico Cr #1 & Experimental pop. in Tellico R #1	Large streams, low gradient, low elevation.	E	G1
1a	<i>Noturus flavipinnis</i>	Yellowfin madtom	LT	2 occ Citico Cr #1 & Experimental pop. in Tellico R #1.	Large streams to large rivers, low gradient, low elevation	T	G1
1a	<i>Percina antesella</i>	Amber darter	C	0 occ	Large streams and small rivers, low gradient, low elevation	E	G1G2

	Scientific Name	Common Name	Range/Watersh/Co	CNF Records	Habitat Information	T&E	G-Rank
1a	<i>Percina jenkinsi</i>	Conasauga logperch	C	2 occ Conasauga R #1 & Jack's R	Medium river, moderate gradient, low elevation	E	G1
1a	<i>Percina tanasi</i>	Snail darter	O, H, LT	2 occ Hiwassee R #1 & Citico Cr #1	Large streams to medium rivers, low to moderate gradient, low elevation.	T	G2G3
Mussels							
1a	<i>Alasmodonta raveneliana</i>	Appalachian elktoe	N, P, FB,LT	1 occ. Nolichucky R.	Small to medium rivers, moderate gradient, moderate elevation	E	G1
1a	<i>Epioblasma florentina walkeri</i>	Tan riffleshell	H	2 occ Hiwassee R. #4 & #5	Small to large rivers, low gradient, low elevation	E	G1T1
1a	<i>Epioblasma metastriata</i>	Upland combshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	GH
1a	<i>Epioblasma othcaloogensis</i>	Southern acornshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	GHQ
1a	<i>Hamiota altilis</i>	Finelined pocketbook	C	2 occ Conasauga R #1 & #2	Large streams to medium rivers, low to moderate gradient, low elevation	T	G2
1a	<i>Lexingtonia dolabelloides</i>	Slabside pearlymussel	H,N,FB,P,LT	2 occ Hiwassee R. #4 & #5	Small streams to large rivers, moderate to high gradient, low elevation	S{C}	G2
1a	<i>Medionidus acutissimus</i>	Alabama moccasinshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	T	G2
1a	<i>Medionidus parvulus</i>	Coosa moccasinshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1Q
1a	<i>Pleurobema decusum</i>	Southern clubshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	G2
1a	<i>Pleurobema georgianum</i>	Southern pigtoe mussel	C	2 occ. Conasauga R #1 & #2	Medium rivers, moderate gradient, low elevation	E	G1
1a	<i>Pleurobema perovatum</i>	Ovate clubshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1
1a	<i>Ptychobranhus greenii</i>	Triangular kidneyshell	C	1 occ Conasauga R #1	Large streams, low gradient, low elevation	E	G1Q
1a	<i>Villosa trabalis</i>	Cumberland bean pearly mussel	H,N	2 occ Hiwassee R. #4 & #5	Large streams and small rivers, low gradient, low elevation	E	G1
Reptiles							
1a	<i>Glyptemys muhlenbergii</i> (S. pop)	Bog turtle	MA south to GA, TN	1 TDEC record Johnson Co.; CNF record Carter Co.	Slow, shallow, mucky rivulets of sphagnum bogs, seeps, wet cow pastures, & shrub swamps	T (SA)	G3
Non-vascular Plants							
1a/7a	<i>Gymnoderma lineare</i>	Rock gnome lichen	TN, NC, SC, GA	1 Record, Roan Mountain	High elevation rocky summits and rock outcrops.	E	G2

	Scientific Name	Common Name	Range/Watersh/Co	CNF Records	Habitat Information	T&E	G-Rank
Vascular Plants							
1a/7a	<i>Geum radiatum</i>	Spreading avens	Mountains of NC, TN. Sevier, Blount, Carter.	3 Records	Thin soil on rocky summits, cliffs, & ledges; open, grassy balds near <i>Rhododendron catawbiense</i> ; >4200'.	E	G1
1a/7a	<i>Hedyotis purpurea</i> var. <i>montana</i>	Roan Mountain bluet	Mountains of NC, TN. Carter	1 Record	Habitat includes crevices in rock outcrops and gravelly soils at the edges of grassy balds.	E	G5T2Q
7a	<i>Isotria medeoloides</i>	Small whorled pogonia	ME to GA; Midwestern US and CAN. Washington, Hamilton.	0 Records	Open deciduous, or mixed pine-deciduous forests, often on dry to moist leaf litter.	T	G2G3
1a	<i>Pityopsis ruthii</i>	Ruth's golden aster	Southeast TN	12 Records; Polk Co.	Crevices in phyllite & greywacke boulders in historical flood zone Ocoee & Hiwassee Rivers.	E	G1
1a/7a	<i>Platanthera integrilabia</i>	White fringeless orchid	VA to GA, KY to AL, MS. Polk, Monroe and several Cumberland Plateau counties	2 Records	Forested wetlands with open or semi-open canopy. Wet, flat, boggy areas at the head of streams or seepage slopes. Often found in association with <i>Sphagnum</i> and <i>Osmunda cinnamomea</i> , <i>Woodwardia areolata</i> , and <i>Thelypteris novaboracensis</i> , in acidic muck or sand, and in partially, but not fully shaded areas.	S	G2G3
1a	<i>Solidago spithamea</i>	Blue Ridge goldenrod	Mountains of NC, TN. Carter Co, Roan Mtn.	1 Record	Rocky places (outcrops, ledges, cliffs, balds) above 4500 ft.	T	G1
1a	<i>Spiraea virginiana</i>	Virginia spiraea	AL, GA, KY, LA, NC, OH, PA, TN, VA, WV	1 Record, no longer extant; Unicoi Co., Nolichucky River	Riverbanks and riverside shrub thickets; rocky areas susceptible to flood scour. Riparian dependent.	T	G2

*PRC = Project Review Code; to get the appropriate code for each species use the Project Review Code List.

* Co. = Counties from which the species is currently known. Does not represent potential occurrence. Counties of occurrence for vascular plants obtained from University of TN Plant Atlas, online version, 4/04.

- Range abbreviations refer to the major watersheds on the Cherokee NF: Conasauga, Ocoee, Hiwassee, Little Tennessee, Pigeon, French Broad, Nolichucky, Watauga, and South Holton.
- Forest Occurrence Data is based upon currently known records.
- Habitat Information is only a summary. For a more thorough discussion on species, refer to the individual species write-ups that have been provided.
- For streams the following definitions apply:

Orders	Gradients	Elevations
small 3, 4	low <=2%	low<=1200'
medium 5, 6, 7	moderate>2% - <=4%	high>1200'
large 8, 9	high>4%	

ATTACHMENT B

Project Review Code (PRC) for each T&E Species

1a = The project is located out of the species known range, or suitable habitat does not exist in the project area. Determination of Effect: T&E – No Effect.

2a = All requisite habitat has been identified and excluded from disturbance associated with the project. Therefore, the project is expected to have no effects regardless of the number and location of individuals in the area affected by the project. Determination of Effect: T&E – No Effect.

3a = The project is being implemented for the benefit of the species, and is expected to have totally beneficial effects regardless of the number and location of individuals in the area affected by the project. Determination of Effect: T&E – Not likely to adversely affect.

4a = It is assumed that the species is present. Additional information on the number and location of individuals is not needed to improve the design and/or application of mitigation to reduce adverse effects, or to allow a better assessment of effects to viability of the population.

5a = The species is already covered by a current site-specific inventory for the project area and additional inventories are not needed.

6a = Inventory methods are not technically or biologically feasible and effective for providing substantial information on the number and location of individuals. It is assumed that the species is present.

7a = A site-specific inventory was conducted, but the species was not found in the project area. Determination of Effect: T&E – No Effect.

7b = A site-specific inventory was conducted, and the species was found in the project area.